BOYD AND THE PAST: A LOOK AT THE UTILITY OF ANCIENT HISTORY IN THE DEVELOPMENT OF MODERN THEORIES OF WARFARE

A Monograph

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ABSTRACT

BOYD AND THE PAST: A LOOK AT THE UTILITY OF ANCIENT HISTORY IN THE DEVELOPMENT OF MODERN THEORIES OF WARFARE, by Maj Richard M. Fournier, 42 pages.

What utility does ancient military history have for the development of modern theories of warfare? This monograph discusses the development of theory from ancient history by examining the theories and writings of United States Air Force Colonel (retired) John Boyd.

Ancient history is useful for development of modern military theories. Ancient history played a significant role in the development of his theories on maneuver warfare. The abstract concepts he synthesized provide valuable instruction to modern operational artists on how to use ancient history in the development of their own theories and doctrine. Boyd arrived at the past with his theories in mind and then went searching for proof. He effectively linked concepts from the Battle of Cannae, among others, and the Mongol invasion of Europe. From these historical examples, Boyd showed how maneuver and moral warfare developed and how inferior forces used these styles of warfare to defeat superior opponents.

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ACRONYMS

CAS   Close Air Support

OODA Observe-Orient-Decide-Act

SAMS School of Advanced Military Studies

INTRODUCTION

We can portray the past as a near or distant landscape…We can perceive shapes through the fog and mist, we can speculate as to their significance, and sometimes we can even agree among ourselves as to what these are. Barring the invention of a time machine, though, we can never go back there to see for sure.

— John Lewis Gaddis, *The Landscape of History*

Ab uno disce omnes

— *Virgil*

The Prussian strategist, Carl von Clausewitz, observed in *On War* that history becomes less useful the further back one travels in time due to a loss of details and context.[1] While military theorists and strategists prior to Clausewitz made ample use of ancient history to develop their theories on warfare, those who came after generally had a distinct disregard for pre-gunpowder conflict. This was due in part to Clausewitz's admonition of quackery against those who made the attempt.[2] As the weapons of war changed, many felt that the old styles of warfare had nothing left to teach. As a result, many contemporary historians and theorists find no reason to study ancient history's landmark battles.[3] Unsurprisingly, today's operational artist lacks a firm grounding in the study of ancient military operations.

Do modern theorists read too much into Clausewitz's admonishments on the utility of ancient history? Does a trip backward in time make history too abstract and therefore less useful? These questions are ones modern theorists should ask. Of course, not all modern theorists disregard ancient history. One such theorist that sought to understand warfare through both ancient and modern battles was United States Air Force Colonel (retired) John Boyd. He

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[1]Carl von Clausewitz, *On War*, Indexed Edition, Reprint ed. (Princeton, NJ: Princeton University Press, 1989), 174.

[2]Ibid., 174.

[3]Victor Davis Hanson, *The Father of Us All: War and History, Ancient and Modern* (New York: Bloomsbury Press, 2011), 27.

extensively studied ancient warfare in order to formulate his theories on maneuver warfare. An

Air Force fighter pilot by trade, Boyd began to study history during the development of the A-10

Thunderbolt II, seeking to understand how the close air support (CAS) aircraft would

complement armored maneuver warfare.[4] How Boyd used ancient history in theory development

is relevant to today's operational artist and can serve as an example of the utility of ancient

history.

In developing his theories on maneuver warfare, Boyd read history backwards. He first

analyzed trench, maneuver and guerilla warfare in the 20th century. Boyd then turned his focus to

warfare as practiced by Napoleon, the Mongol Horde, Romans and Carthaginians, and ancient

Greeks. Stopping when he reached Sun Tzu, the result of Boyd's studies was a synthesis of

warfare from the beginning of recorded history to today. By combining his study of history with

systems theory and his knowledge on how people make decisions, Boyd put together his *magnum

opus*, a massive deck of acetate slides called *"Patterns of Conflict"* which guided marathon

briefings on his theories. Additionally, combining his study of history with his knowledge of

energy management in air-to-air combat, Boyd constructed his best-known theory, the Observe-

Orient-Decide-Act (OODA) Loop.[5] The basic OODA loop is a simplification of his theories on

decision-making and maneuver warfare which demonstrate how an individual or organization

makes decisions and how one can "maneuver" inside his opponents decision cycle thus causing

them to make a critical error.

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[4]Grant T. Hammond, *The Mind of War: John Boyd and American Security* (Boston: Smithsonian Books, 2004), 121.

[5]Ibid., 123.

Research Question and Significance

The question for consideration is what utility does ancient military history have for the development of modern theories of warfare? Addressing this question requires a detailed examination of how one historian and theorist has used history in his work. Analyzing the ancient battles used by John Boyd in the development of his theories will provide a baseline and a framework from which the operational artist can start to construct theory. Because Boyd never formally published his work beyond "Destruction and Creation," his briefings are extremely important to understanding his use of history. Unfortunately, *"Patterns of Conflict"* gives very few notes as to what Boyd discussed during his presentations. Fortunately, Boyd documented the sources he used for his analysis (though direct citations are missing). While problematic to the researcher looking to replicate Boyd's analysis, Boyd's briefing slides still provide a wealth of information on what he saw as the major points from his historical analysis and how they fit into his overall narrative. In analyzing Boyd's theory development, this monograph compares the interpretations of other historians to further demonstrate the utility of ancient history.

Hypothesis

Ancient history is useful for the development of modern military theories. Clausewitz's remarks on the use of history do not discount this utility. One modern military theorist that effectively used ancient military history in the development of his theories was John Boyd. Ancient history played a significant role in the development of his theories on maneuver warfare. The abstract concepts he synthesized provide valuable instruction to modern operational artists on how to use ancient history in the development of their own theories and doctrine. Boyd arrived at the past with his theories in mind and then went searching for proof. When analyzed in conjunction with other analyses of the Battles of Cannae and the Mongol invasion of Europe, Boyd's case studies demonstrate the utility of ancient history and highlight the need for greater understanding of ancient history to better our understanding of modern warfare.

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Theoretical Framework

Boyd's *"Patterns of Conflict"* slide deck forms the basis for his theories on ancient and medieval warfare. A look at John Boyd's theories and their historical sources provides the background to analyze John Boyd's use of military history. Interpretations from other historians add context to Boyd's theories and provide confirmation that his historical readings were sound. Boyd studied many battles during his reading; to reduce the scope for analysis, the monograph only discusses the Battle of Cannae and the Mongol invasion of Europe. Boyd saw the Battle of Cannae, one of the most studied battles of ancient warfare, [6] as a good example of maneuver warfare.[7] Historians have analyzed this battle more than other battles occurring in temporal proximity, which makes Cannae a good case study to analyze Boyd's theories. There are two primary historical accounts detailing the Battle of Cannae, the works of Livy and Polybius, along with numerous secondary sources analyzing the Punic Wars. However, while there is no proof that Boyd did not read Livy and Polybius, the absence from "Pattern of Conflict" rather extensive bibliography sheds doubt on their use. However, Boyd did read multiple secondary sources that were familiar with the Livy and Polybius.[8]

The Mongols are the other example of pre-gunpowder warfare that Boyd analyzed. Boyd saw the Mongols as exemplars of attacking the moral structure of enemy forces.[9] Boyd's analysis of the Mongol invasions is more limited, existing mostly through secondary sources. It was not until well after Boyd's death those primary sources detailing the Mongol Invasions came to light.

[6] Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic* (New York: Random House, 2010), 13

[7] Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd* (London: Routledge, 2006), 143.

[8] John Boyd, "Patterns of Conflict" (Defense and the National Interest, 2007), Bibliography. http://www.dnipogo.org/boyd/patterns_ppt.pdf (accessed August 12, 2012).

[9] Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 143.

Nevertheless, the Mongol conquest of Western Asia and Eastern Europe has long fascinated historians who have sought to understand how theses "barbarians" were so effective against Western armies.

Together, these two battles provide data points for how Boyd used history in the development of his theories. Looking at other historian's analyses creates a better understanding of Boyd's theories. Together, Boyd's theories and other historical scholarship answer the question of what utility ancient history provides in the development of military theories.

<u>Literature Review</u>

None of the authors who have written biographies on John Boyd spends a significant amount of time on how Boyd actually developed his theories from history. They mention his reading of history from present day back, but tend to accept the results of his analysis at face value. Boyd himself relied on the interpretation of secondary sources and did not look at primary sources.[10] Ultimately, this lack of primary sources did not matter, as Boyd was more interested in what others said because it allowed him to deconstruct their arguments and synthesize them better into his theories.

One of these authors, Robert Coram wrote a biography of Boyd titled *Boyd: The Fighter Pilot Who Changed the Art of War*; while spending some time on Boyd's theories, Coram focused mainly on Boyd's life.[11] The second author to focus on Boyd, Grant Hammond in *The Mind of War: John Boyd and American Security,* discusses the development Boyd's theories, but does not mention the history informing those theories. Hammond mentions only that Boyd became interested in history and read voraciously. He does not do an independent review of Boyd's

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[10]John Boyd, "Patterns of Conflict", Bibliography. As previously discussed, the absence of primary sources in the bibliography tends to shed doubt on their use.

[11]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (New York: Back Bay Books, 2004).

analysis.[12] The third author to write about Boyd, Frans Osinga, focuses heavily on Boyd's theories and what they mean for the future of warfare in *Science, Strategy and War: The Strategic Theory of John Boyd*. He accepts the results of Coram and Hammond and builds further upon Boyd's theories. While Osinga spends the most time analyzing Boyd's theories, he accepts the conclusions of Boyd's trip through history without looking at the underlying sources of Boyd's knowledge.[13] As a result, there is a need to look critically at Boyd's use of history in the development of his theories.

There is one monograph from the School of Advanced Military Studies (SAMS) that deals directly with Boyd and his theories, but this monograph does not spend a large amount of time analyzing how Boyd utilized history.[14] The monograph focuses mainly on Boyd's developed theories and their utility for the United States Army but does not attempt to analyze the history that went into them or touch on the utility of history in general.

As far as the sources available to study the Battles of Cannae and the Mongol invasion, there are many. Historians have studied both the Punic Wars and the Mongol Hordes in-depth. A few military theorists have shown interest in drawing lessons from these two campaigns. In the case of Cannae, Count Alfred von Schlieffen was extremely interested in battles like Cannae as he believed that Germany's position in the world would require them to fight wars against stronger, more numerous opponents. When British theorists, Basil Liddell-Hart and J.F.C. Fuller, started to develop their own theories on maneuver warfare in the early twentieth century, they looked at the Mongols in detail.

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[12]Grant T. Hammond, *The Mind of War: John Boyd and American Security*, 121.

[13]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd,* 1–3.

[14]Robert B. Polk, "A Critique of The Boyd Theory — Is It Relevant to the Army?" (Ft. Leavenworth, KS: School of Advanced Military Studies), 1.

The first section presents a biography of Boyd and discusses his theories concerning maneuver warfare to understand better the conclusions he drew from ancient warfare. The next section gives a brief synopsis on the use of history by Niccolò Machiavelli, Carl von Clausewitz, John Lewis Gaddis and John Boyd. The last two sections present case studies on two of the ancient styles of warfare that Boyd studied, the Battle of Cannae and the Mongol Invasion of Europe. Each of these two chapters has the same structure. First, there is a brief synopsis of the battle or campaign. Second, an analysis of Boyd's orientation of those events within the larger framework of his theory occurs. Lastly, interpretations from other historians and theorists provide context for and synthesis with Boyd's theories and show how ancient history supported Boyd's theories.

BOYD AND HIS THEORIES

Biography

While Boyd used history to aid in the development of his maneuver warfare theories, many of his theories stemmed directly from his own experience as a fighter pilot in the Air Force. Therefore, it is helpful to examine who Boyd was and what the influences over him were in order to better understand his theories. John Boyd hailed from Erie, Pennsylvania. Growing up in near poverty following the death of his father, Boyd learned the value of hard work.[15] Upon graduating college, Boyd enlisted in the Air Force and served in the Korean War. While there, he became involved in an incident that forever colored his perception of senior leadership. Noticing that the leadership left the enlisted to suffer in the cold, Boyd acquired wood from a nearby building to burn in fires. Brought before the commander, Boyd was able to argue his way out of a court-

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[15]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 16–17.

martial. From this point, Boyd lost all fear of taking on the establishment.[16] To some degree, this also became a fault of Boyd's; he would later tell young officers that they had a choice, either to do what is right or to do what is necessary for their career.[17] Boyd came to view the world as system of polar opposites; there were no shades of gray. These polar opposites would later inform many of Boyd's theories, even explaining to some degree Boyd's fascination with the Taoist principles underlying Sun Tzu's, *The Art of War*. Boyd saw Sun Tzu as a kindred spirit who saw the world in the same way he did.

After Korea, Boyd became an officer, attended pilot training, and became a successful fighter pilot and one of the primary instructors at the USAF Fighter Weapons School. While there, Boyd started to develop his theories on energy management in air-to-air combat. These theories provided the framework for what would later become the OODA loop.[18] During his later years in the Air Force, Boyd became involved in the development of what would become the A-10 Thunderbolt II, the F-15 Eagle, and the F-16 Falcon. While working on the A-10 project, Boyd became interested in history while studying historical examples on the use of CAS to support armor maneuver. From here, Boyd started reading any history books he could get his hands on and started noticing patterns throughout history. After leaving the Air Force in 1975, Boyd became a contractor working at the Pentagon and started fully developing his theories on maneuver warfare. He traveled around the country giving his views on maneuver warfare to anyone who would listen. Boyd refused to allow anyone to pay for his speaking appearances,

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[16]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 32.

[17]Grant T. Hammond, "On the Making of History: John Boyd and American Security," *The Harmon Memorial Lecture, 2012* (US Air Force Academy, 2012).

[18]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 147–149.

living only on his pension from the Air Force.[19] Boyd dedicated himself to reforming the military's understanding of war.

<div align="center">Theories</div>

While Boyd's best known theory is the OODA loop, nominally a tactical decision making cycle, his theories actually extend deeper into the operational and strategic realm. Boyd saw the primary purpose of theory as a way to educate people and impart a new way of thinking about war and strategy.[20] Understanding the OODA loop, though, is critical to understanding the ramifications of Boyd's theories. The OODA loop, or Boyd Cycle, is not merely a decision making cycle. While the OODA loop initially started as such, Boyd slowly developed the underlying concepts to expand the OODA loop into a systems based theory. While the common explanation of the Boyd Cycle describes it as a simple decision cycle consisting of Observe, Orient, Decide and Act elements, it is actually much more complex.

The OODA loop found its genesis from Boyd's own experience as a fighter pilot. Analyzing fighter pilot actions over the skies of Korea, Boyd theorized that the Americans' increased ability to maneuver against the superior Chinese-flown MIG-15's from the bubble-shaped canopy of their own F-86 Sabres enabled them to defeat them through fast-transient maneuvers.[21] Combining his observations from the Korean conflict, his knowledge of fighter tactics, and his study of history, Boyd eventually synthesized his thoughts into the OODA loop. The Orient phase consists of taking in all relevant information and processing that information through filters present in one's mind. The Orient phase works as a black box for information – data goes in and information comes out. Orientation is the central component of the cycle; it

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[19]Grant T. Hammond, *The Mind of War: John Boyd and American Security*, 12.

[20]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 12.

[21]Robert B. Polk, "A Critique of The Boyd Theory — Is It Relevant to the Army?"

shapes how we interact with the environment. Boyd's overarching theme throughout his work is the "capability to evolve, to adapt, to learn, and deny such capability to the enemy."[22] This ability to adapt constantly to the environment is at the heart of maneuver warfare. If one is able to maneuver inside an opponent's decision cycle, they will be able to keep the opponent from adapting to change. This, in turn, will cause the opponent the freeze, or stall, in indecision at which point a decisive blow lands.[23] Viewing the opponent in the context of systems theory, the opponent's system enters a negatively reinforcing cycle from which they are unable to recover. While understanding the OODA loop is vital to understanding Boyd's theories, the genesis of the OODA loop provides more insight into Boyd's use of history.

Boyd viewed the world as a dynamic system. His theories therefore had to be capable of shifting as necessary to fit the situation. Drawing upon the ideas of Godel, Heisenberg, and thermodynamics, Boyd's only written work, *"Destruction and Creation,"* detailed the ideas that underpin all of his later theories. There are three main concepts that Boyd synthesizes in this paper. First, Godel's inconsistency proof states that in any consistent system, an observer cannot determine the systems consistency from within.[24] Second, Heisenberg's uncertainty principle states that when an observer fixes a system in place, the observer cannot determine to what degree the system diverges from reality; if the observer measures the precision of the system, then the system is no longer fixed in place.[25] The third element of Boyd's theory comes from the

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[22]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 237.

[23]Everett Dolman, *Pure Strategy: Power and Principle in the Space and Information Age* (Maxwell AFB, AL: Air University Press, 2007), 133.

[24]John Boyd, "Destruction and Creation" (Defense and the National Interest, 1976), 4. http://pogoarchives.org/m/dni/john_boyd_compendium/destruction_and_creation.pdf (accessed August 12, 2012).

[25]Ibid., 5.

second law of thermodynamics, which states that entropy must increase in any closed system.[26]

These three elements together, according to Boyd, state that we cannot know the nature of a

system from within and any attempt to do so will increase uncertainty. Eventually the system will

self-destruct as the difference between the observed state and reality continue to diverge. This

forms the basis of Boyd's theories — in order to understand a theory, one must first analyze, or

destroy the theory and reduce it to its simplest parts. From those pieces, one can synthesize, or

create a new theory.[27] It is with this in mind, Boyd sets out to analyze history and develop his

theories about maneuver warfare.

For Boyd, maneuver warfare, as outlined by Frans Osinga, in *Science, Strategy and War,*

uses ambiguity, deception, novelty, and violence to generate shock and surprise. In this state, an

enemy is susceptible to a focused attack using firepower and maneuver in concert in order to

bring their system to a state of paralysis.[28] The aim of military operations is twofold: create a

highly fluid environment for the enemy and disrupt their ability to adapt to that fluid

environment.[29] Boyd saw maneuver warfare opposed by attrition warfare, the style of warfare

practiced primarily by Napoleonic armies, in the trenches of World War I, and by the Allied

powers in World War II. Attrition warfare is the use of massive armies thrown at each other with

excessive firepower in order to overwhelm the enemy. The objective was to seize and hold terrain

and then utilize protective barriers for defense. Costly and destructive, Boyd felt that armies

should avoid attrition warfare. The practitioners of maneuver warfare, in Boyd's eyes, were the

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[26]John Boyd, "Destruction and Creation", 6.

[27]Ibid., 7.

[28]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 166–168.

[29]David S. Fadok, "John Boyd and John Warden: Airpower's Quest for Strategic Paralysis," *The Paths of Heaven* (Maxwell AFB, AL: Air University Press, 2007), 364.

Carthaginians, Mongols, General Ulysses S. Grant, and Adolf Hitler's generals along with Generals George S. Patton and Douglas MacArthur.[30]

Maneuver on the battlefield is not enough, though. To accomplish the shock and surprise necessary to overwhelm the enemy and cause their decision cycle to stall, Boyd presents a third kind of warfare— moral. In Boyd's theory, small light forces utilize moral warfare by relying heavily on leadership and trust. Throughout history, guerillas and revolutionaries relied on this style of warfare to overcome their enemies. When combined with maneuver warfare, as in the case of Genghis Khan and the Mongols, the effects could be devastating.[31] It is this combination of maneuver and moral warfare that Boyd highlighted as the preferred style for modern maneuver forces. His theories went beyond mere tactical application, though. Boyd expanded them to address operational issues through command and control of those forces and to strategic goals that made the style of warfare possible. [32]

Other than a short essay titled "Destruction and Creation", Boyd never published his theories in written form, leaving that work to his followers. Part of the reason Boyd never published was that he never wanted to finish an intellectual effort. As he made changes, he would notice mistakes in his earlier thought processes and start over.[33] Boyd never viewed his work as being complete, only existing in a temporary manner between creation and destruction. Boyd was always learning and feared that to publish would fix his ideas in time, which would then yield their own entropic destruction.

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[30]John Boyd, *"Patterns of Conflict,"* 111.

[31]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 166.

[32]Boyd's concept of command and control is surprisingly close to the Army's current concept of Mission Command. See United States Army*, Mission Command* (ADP 6-0) (Washington DC: Department of the Army, September 2012).

[33]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 309.

ROLE OF HISTORY

Criteria for Analysis

Boyd was not a trained historian and did not operate in accordance with established models of historical analysis.[34] While this creates several problems in understanding his work, it is possible to look objectively at his conclusions. To answer the question, how did Boyd find utility in history, one must look at how Boyd used history in the development of his theories on maneuver warfare. Showing how Boyd used history will show the utility of ancient history and demonstrate how military practitioners can do the same. Looking at the interpretations of other historians and theorists will add further understanding of Boyd's work.

Uses of History

By looking at how other historians, both past and present, have studied history with the intent of generating theories, we can better understand Boyd's use of history. Niccolò Machiavelli was the first modern theorist to discuss the utility of history in theory development and its use in operational art. While *The Prince* is Machiavelli's better known work because it contains his political theories, he viewed his treatise, *The Art of War*, as his most important work. Therein he discussed his own theories on the conduct of war. He analyzed both recent and ancient battles in order to derive several principles. Continuing his thoughts on military theory in *The Prince*, he argued that a leader must be familiar with the past and then be able to apply the principles derived to his current or future situations.[35] Machiavelli made little distinction as to whether examples that are more recent were preferable over distant ones. Machiavelli viewed the lessons derived from history as enduring. If a leader could learn a lesson from the past, then history had utility.

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[34]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 33.

[35]Niccolò Machiavelli, *The Prince and Other Writings* (New York: Barnes & Noble Classics, 2003), 63–65.

Carl von Clausewitz viewed historical examples as a clarifying element and the best proof for the art of war. He argued, however, that theorists tend to misuse historical examples and that the further one goes back in history, the less useful and more abstract any theories drawn from those historical examples become.[36] Clausewitz stated that theory is normally content to rely on experience to indicate its origin.[37] If, on the other hand, the theorist is using experience to dislodge current theory in favor of new theory, then historical proofs are necessary. Clausewitz outlined four points of view on the way a theorist could use historical examples to support their ideas; each way subsequently requiring more stringent requirements to prove. First, as an explanation of an idea—historical or imaginary cases will do here. Second, to show the application of an idea—details are more important here, but authenticity is not required. Third, to prove the possibility of an idea—an undisputed historical fact suffices. Fourth, to deduce a doctrine—a detailed presentation of multiple historical events is required here. In order to deduce a doctrine from historical examples, the theorist must fully develop every aspect of the theory; where precision is not available, quantity will have to make up the difference.[38] Because of the precision of the facts required to deduce a doctrine, Clausewitz argued that recent history provides a better platform for theory making because its detail is still fresh and the context surrounding the events are still familiar to the theorist. While, this argument does not deny the utility of ancient history, it greatly diminishes ancient history's value in Clausewitz's view. Going further back in time requires that one abandon details and focus on generalities. Because of the reduced context and details from ancient history, a theory based on ancient history can only be as detailed as the evidence supporting it. This does not mean that ancient history is not useful

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[36]Carl von Clausewitz, *On War*, 170.

[37]Ibid., 171.

[38]Ibid., 171–173.

though. By using multiple examples to show a point, the theorist can overcome the lack of fidelity from ancient history. Boyd would use a multitude of ancient battles to show the possibility of his concept of maneuver and moral warfare in defeating an enemy. In doing so, he aligns with Clausewitz's third use of historical proofs.

Jumping forward to modern theorists and historians, John Lewis Gaddis in *The Landscape of History*, discussed the utility of history but warned against using it to predict the future. To Gaddis, historians present the landscape of the past. This presentation, or narrative, allows the reader to experience a wider view of the past from the perspective of the historian.[39] Because of the expanse of time between the past and now, the past can only approximate what happened. The more time the narrative tries to cover, the more imprecise, or abstract the narrative becomes.[40] Over time though, certain patterns emerge from the past.[41] These patterns allow the practitioner looking at history to form generalizations about past processes that have produced present structures. This particular generalization as Gaddis called it, provides an understanding of the past within the context of the present but has little applicability for future behavior.[42] History, therefore, provides utility because it allows the historian to discern patterns in the march of time and events.

<u>How Boyd Saw History</u>

Boyd became interested in history while doing research on close air support during the development of the A-10 Thunderbolt II. As a CAS platform, the A-10's primary mission would be destroying Soviet tanks as they moved across the Fulda Gap in Germany. Boyd wanted to

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[39]John Lewis Gaddis, *The Landscape of History*, 5.

[40]Ibid., 15.

[41]Ibid., 30.

[42]Ibid., 62.

know how tanks maneuvered on the battlefield in order to increase the effectiveness of the A-10.

Drawn to the work of J.F.C. Fuller and Basil Liddell Hart, Boyd became interested in the history

of maneuver warfare.[43] Boyd wanted to know if there were any valid comparisons between the

way land forces fought and the concepts he had developed while studying air-to-air combat.[44]

When Boyd looked at the works of armor pioneer Heinz Guderian, he found historical references

with which he was unfamiliar.[45]

To eliminate this unfamiliarity, Boyd started working backwards through history to trace

the development of key concepts of maneuver warfare. Eventually he reached Sun Tzu where

Boyd concluded that most historians looked at history incorrectly. By looking at history from

ancient times to modern times, historians viewed history as a series of stair steps, viewing sudden

leaps in technology and culture as radical breaks, or paradigm shifts.[46] These paradigm shifts, a

concept popularized by Thomas Kuhn, help explain how new theories propagate and spread.[47]

Boyd argued that by examining history from modern times to ancient times, one is able to see

knowledge as cumulative rather than episodic.[48] In a sense, Boyd rejected the idea of paradigm

shifts when applied to history. Where Kuhn argued that the fluid, seamless view of history occurs

because of new paradigms absorbing the ideas and language of previous paradigms,[49] Boyd saw it

as a synthesis of theories, with progress occurring because of the continuous analysis old ideas

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[43]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd,* 29.

[44]Tom Hayden and H. T. Hayden, eds., *Warfighting: Maneuver Warfare in the U.S. Marine Corps* (Mechanicsburg, PA, USA: Greenhill Books, 1995), 19.

[45]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 331.

[46]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 29.

[47]Thomas Kuhn, *The Structure of Scientific Revolutions*, 111.

[48]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 29.

[49]Thomas Kuhn, *The Structure of Scientific Revolutions*, 139 & 149.

and their synthesis with new ideas over time.[50] Systems theory also played a prominent role in

Boyd's view of history. By viewing history as the behavior of a system over time, Boyd realized

there were patterns that comprised history, which continually repeated.[51] The emergence of

patterns is a key concept in systems theory. Coining the phrase "patterns of conflict," Boyd used

these patterns to form the central core of his theories.

The work of Sun Tzu formed the central concept and starting point for Boyd's

restructuring of history. *The Art of War*, attributed to Sun Tzu, is the oldest surviving Chinese

treatise on strategy and military operations that exists today.[52] Written sometime after 512 B.C. it

details in thirteen chapters the principles that a general should understand if they are to practice

warfare. Sun Tzu's approach to warfare is that it is the "greatest affair of the state, the basis of life

and death."[53] During the warring states period in China, several states had fallen or were in

danger of falling themselves. Sun Tzu wrote for the Chinese leader interested in preserving his

state against those of his rivals. To Boyd, Sun Tzu was the father of military strategy and "*The

Art of War* became Boyd's Rosetta Stone…the only theoretical book on war that Boyd did not

find fundamentally flawed."[54] Boyd spent more time during his briefings on Sun Tzu than any

other military theorist. Boyd devotes five slides in *"Patterns of Conflict"* to Sun Tzu. Boyd

condensed Sun Tzu's theories to the following: preservation of the state is the primary objective

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[50]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 69. Boyd did see utility in Kuhn's theories on paradigms when applied to mismatches that occur between reality and our perception of reality.

[51]Ibid., 29.

[52]Sun Tzu and Ralph D. Sawyer, *The Art of War* (Boulder: Westview Press, Inc., 1994), 79. Whether Sun Tzu was a single person, or the amalgamation of several Chinese theorists over a period of time is not important. The theories expressed in the Art of War exist and are applicable to the study of warfare.

[53]Ibid., 128.

[54]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 331.

that drives war and strategy is concerned with putting the enemy off balance. In order to achieve this several traits are necessary: foreknowledge, cohesion, surprise, deception and deceit, being unfathomable and speed. Utilizing these traits in the proper combination would allow a leader to overcome his enemy with reduced risk to his own forces. Boyd ultimately drew upon Sun Tzu's idea that there were polar opposites at work. Whether this idea is orthodox vs. unorthodox, direct vs. indirect, or Eastern vs. Western, Boyd saw these polar opposites as the foundation of strategy.[55] His only written work reflects these concepts as destruction and creation. His study of Sun Tzu and his own experience as a fighter pilot strengthened these concepts. [56] This idea of continuous cycles of destruction and creation informs Boyd's theories and are critical to Boyd's understanding of history.

Sun Tzu advocated a strategy utilizing four key elements: probe the enemy to uncover strengths, weaknesses, and patterns of maneuver; shape the enemy's perception of the world; attack the enemy's plans, alliances, and then army; employ direct and indirect maneuvers against the enemy's weaknesses while avoiding his strengths.[57] Boyd then took the ideas of Sun Tzu and started looking for continuity throughout history working forwards to draw examples of these principles in action. Those leaders that followed Sun Tzu's principles Boyd dubbed "Eastern" leaders, while those who did not were "Western" leaders.[58] Boyd was agnostic in his use of history and theorists in developing his own theories. He read extensively on both Western and

[55]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd,* 39–41

[56]Boyd's use of EM Theory was the foundation for "Destruction and Creation."

[57]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd,* 143. These ideas are reflected in Boyd's concept of the OODA Loop

[58]Robert Coram, *Boyd: the Fighter Pilot Who Changed the Art of War*, 331. The idea is that Eastern leaders are circular, or indirect, in their approaches while Western leaders favored a direct method of confrontation.

Eastern styles of warfare. Additionally, time was not a factor in his studies. He saw utility in both ancient and modern theorists, and the gamut in between. As an example of historical agnosticism, Boyd made no secret that Mao Tse Tung's theories influenced his own.[59]

Boyd identified with the Taoist concepts of *ch'i* and *cheng*, which fit nicely with his own thoughts on the behavior of polar opposites.[60] In Taoist philosophy, the concept of Yin and Yang include a bit of the other in them. Balance is what drives the world in this philosophy; Boyd sought ways to disrupt the balance and establish primacy over the opposing system while maintaining harmony within your own system. Sun Tzu emphasized the combination of these elements. From Sun Tzu, Boyd picked those ideas that fit into his concept of maneuver warfare. Boyd arrived at the past with his theories on maneuver warfare in mind and then went searching for proof by examining the patterns that emerged from Sun Tzu's philosophies.

Orientalism refers to the idea of how Westerners have defined the "Orient" or "East" and how they view themselves in relation to that definition. Typically a negative connotation, orientalism entails viewing Eastern ways of war with fascination and an air of superiority.[61] While a critic could argue that Boyd, on the surface, suffered from "military orientalism," the truth lies somewhere in-between. While Boyd may have held this fascination—he did view his vision as a sort of Western Zen[62]—he ultimately sought synthesis between disparate ideas.

Leaving Sun Tzu behind, Boyd then progressed forward through history to find examples of maneuver warfare in practice. Starting with the wars of the ancient Greeks and Romans, Boyd

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[59]David Fadok, "John Boyd and John Warden: Airpower's Quest for Strategic Paralysis," *The Paths of Heaven (*Maxwell AFB, AL: Air University Press, 2007), 370.

[60]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd,* 40.

[61]Patrick Porter, *Military Orientalism: Eastern War through Western Eyes* (New York: Columbia University Press, 2009), 13–15.

[62]Grant T. Hammond, *The Mind of War: John Boyd and American Security*, 15.

outlined four battles that displayed maneuver warfare in the ancient world: Marathon, Luectra, Arbala and Cannae. From there, he analyzed the Mongol invasion of western Asia and Europe. Boyd used the Mongols as an example of maneuver warfare combined with moral warfare. Boyd learned what he needed to from these battles; they served the purpose of highlighting instances in history where maneuver warfare triumphed over attrition warfare.

Leaving ancient history behind, Boyd looked at the battles of Napoleon. With Napoleon, Boyd studied the works of Clausewitz. While finding much of Clausewitz's theories useful, Boyd did not completely agree with the Prussian theorist in several areas.[63] Boyd felt that Clausewitz over-emphasized decisive battle and was more interested in reducing friction in his own forces than creating friction in enemy forces. Boyd's most withering attack, though, was that Clausewitz did not appreciate adaptability.[64] Boyd did find agreement with Clausewitz's use of history. Boyd's historical examples fall in line with Clausewitz's third way to use history, to show the possibility of an idea by showing historical facts to support the statement.[65] Because Boyd was particularly interested in why in certain battles, the clearly outnumbered force came away victorious.[66] He also found common understanding with Clausewitz's view of the past in the idea that theories on war demand going beyond war and testing modern evidence against the past. Clausewitz argued that an independent mind should then come to the same conclusions.[67] When Boyd looked at the battles as a whole, he noticed that a common thread tied them all together. In each battle, the winning side had presented the other with a sudden change in maneuver that the

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[63]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 146.

[64]Ibid., 146.

[65]Carl von Clausewitz, *On War*, 171.

[66]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 331.

[67]Peter Paret, *The Cognitive Challenge of War (*Princeton: Princeton University Press, 2009), 82 & 126.

other side was unable to adapt or to react quickly. This became the genesis for Boyd's OODA loop.

BATTLE OF CANNAE

Many historians consider the Battle of Cannae the bloodiest single battle of not only ancient history, but of all time.[68] The battle occurred in 216 BC in northern Italy during the Second Punic War (218-201 BC) between Carthage and the Republic of Rome. For Hannibal, the damage inflicted on the Carthaginian army during the battle was minimal, but for Rome, it was a different story. On that day, Rome suffered "more battle deaths than the United States during the entire course of the war in Vietnam…more dead soldiers than any other army on any single day of combat in the entire course of Western military history."[69] The Carthaginian general, Hannibal de Barca, famously crossed over the Alps from his base in Spain with a massive Carthaginian army, eventually attacking into northern Italy.[70] After Carthaginian victories at the Battles of Trebia (218 BC) and Lake Tresamine (217 BC), the Roman consul, Fabius Cuncator, started withdrawing to Rome with the intention of reducing the Carthaginian army through slow attrition and then waiting for a decisive moment to strike.

The Roman public − frustrated with the Fabian retreat and the concurrent Carthaginian devastation to the countryside abandoned by Fabius − demanded that the Roman Senate replace Fabius. Bowing to public pressure, the Roman senate replaced him with the consuls Varro and Paullus. Meanwhile, Hannibal proceeded to set up camp at the plains of Cannae. Spurred to

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[68]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 3–4.

[69]Ibid., 5.

[70]Ibid., 69. The famed march of the elephants across the Alps occurred during this time, though they were largely ineffective due to losses and by Cannae, the Romans had figured out how to counteract their effectiveness.

action by the Senate and public pressure, Varro and Paullus proceeded to attack Hannibal with overwhelming force. The Roman legions walked right into the trap laid by Hannibal. As expected, the battle did not end well for the Roman legions; Hannibal's army decisively defeated Rome's 80,000 troops with a much smaller force of 50,000. Only a series of missteps prevented Hannibal from descending on Rome.

Enraged by the disaster that had befallen their armies, Rome embarked on a campaign of revenge against Hannibal's forces, which eventually resulted in the destruction of Carthage at the end of the Third Punic War. Prior to Cannae, Rome was a republic focused on conquering the surrounding Latin tribes. Rome's defeat at Cannae became the catalyst for their future empire. What has fascinated historians and military theorists, Boyd included, is how a much smaller force of Carthaginians was able to defeat the numerically and qualitatively superior Roman Army.

<div align="center">Boyd's Analysis</div>

Outlining the historical period in general from 300 BC to 1400 AD, Boyd emphasized several maneuver characteristics of armies. Armies would use light troops to unmask enemy activities, distort their own, and confuse enemy operations.[71] Heavy troops would then smash the confused enemy forces by attacking their weak points or alternately hold the enemy formations in place in order to make them vulnerable to continued light attacks. This light maneuver and heavy thrust against confused troops was the central idea behind Boyd's maneuver theories.

What Boyd drew from Cannae specifically was the superiority of maneuver on the battlefield. A static force, only interested in defeating the enemy, would open itself to a decisive attack from a force that exploited their weakness. The Romans charged headfirst into the center of Hannibal's army. Hannibal, withdrawing the center, then enveloped the two sides of the Roman

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[71]John Boyd, "Patterns of Conflict", 16.

army. The result was near 48,000 Roman casualties.[72] From Cannae, Boyd viewed envelopment as the key element that the Germans incorporated into *blitzkrieg*.[73]

In reading back through history, Boyd encountered Count Alfred von Schlieffen and likely came to appreciate Hannibal and the Battle of Cannae through his work. Schlieffen had a preoccupation with the Cannae, which pervaded any study of German strategy.[74] Schlieffen is almost solely responsible for modern interest in Cannae, viewing it as one modern critic termed "a Platonic ideal of victory."[75] Like Boyd, Schlieffen wanted to answer the question as to how a smaller force could prevail over a larger force on the battlefield. Surrounded on all sides by enemies, Schlieffen believed that a study of Cannae would yield Germany's key to victory. He ordered his staff to produce a history of battles that utilized the double envelopment in the hopes of finding his answer.[76] General George S. Patton, as well, studied Cannae.[77] The bottom line is that Boyd learned about Cannae from reading about how other theorists and generals viewed

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[72]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic,* 3.

[73]John Boyd, "Patterns of Conflict", 85.

[74]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 264–265. Not only did Schlieffen's work influence German military thought, his writings were translated into English and taught at the U.S. Army's Command and General Staff College.

[75]Ibid., 264.

[76]Count Alfred von Schlieffen, *Cannae*, Preface. There is a sense of irony to be learned from Schlieffen's preoccupation with Cannae. Just as Carthage suffered from a lack of strategy post Cannae, so did Germany. A caution against reading too much into history is a lesson learned here.

[77]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 265.

Cannae. Nevertheless, Boyd viewed the Battle of Cannae as "emphasizing an unequal distribution as basis for local superiority and decisive leverage to collapse enemy resistance."[78]

Boyd defined the essence of maneuver conflict as the ability to create, exploit, and magnify ambiguity, deception, novelty, fast transient maneuvers and effort.[79] The Roman legions lined up opposite the Carthaginian forces believing the Carthaginians to be trapped against the Afidus River and attacked the center. The Romans had an ambiguous impression of the events that were unfolding. Unknown to the Romans the Carthaginian cavalry hid along the Roman flanks. When the Romans pressed the attack, the Carthaginians center withdrew causing the Romans to pursue. Their deception complete, the Carthaginian cavalry attacked, their fast-transient maneuver creating confusion within the Roman ranks and resulting in the Carthaginians routing the Roman legions.

Boyd also found Sun Tzu's principle of having the goal of the commander to defeat the enemy prior to battle as the primary focus.[80] Cannae is famous because Hannibal effectively used a double envelopment to defeat a numerically superior force, a tactic that drew both admiration and admonition from Boyd. While Boyd normally praised maneuver on the battlefield, he argued the double envelopment a tactic whose Siren's call modern commanders should avoid.[81] Nevertheless, Hannibal attacked the Roman center and then withdrew. Hannibal, having fought the Romans before, knew that the Romans would pursue the attack. He chose the battleground perfectly. The Romans were unable to employ their legions in the normal three maniples, or lines,

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[78]John Boyd, "Patterns of Conflict", 24.

[79]Ibid., 115.

[80]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 333

[81]Joseph Fough, "American Cannae: The Old Waggoner and Bloody Ban," Chicago Boyz, http://chicagoboyz.net/archives/13029.html (accessed February 27, 2013).

abreast; they only managed to fit two legions in the narrow confines. Once the Romans pressed the attack in the center, Hannibal sprang the trap. Hannibal set the conditions before the battle began that would increase confusion and friction within the Roman ranks.

<center>Cannae — Synthesis</center>

Boyd used the Carthaginians to show how a smaller force could defeat a larger, better-trained force through maneuver. What can we learn from looking at Boyd's sources and at the interpretations of other historians? Looking at the history behind Boyd's analysis of the Battle of Cannae, one can see where Boyd found utility. Looking at the sources Boyd used it is difficult to establish where Boyd learned about Cannae. Conspicuously absent from Boyd's reading is Liddell Hart's biography of Scipio Africanus, the Roman general who ultimately defeated Hannibal. Boyd's understanding most likely resulted from reading Fuller's *The Conduct of War, 1789-196*1 and the histories of Schlieffen and Patton. Looking at studies of Cannae and Roman warfare from Titus Livy along with Robert O'Connell creates a historical snapshot of what happened at the battle of Cannae.

For Boyd, Hannibal was the architect of Cannae. Boyd viewed Hannibal as an example of an Eastern general and the ultimate reason the Carthaginians had any success on the battlefield. Unfortunately, there are no records of Hannibal from his own country. So severe was the devastation of Carthage at the hands of the Romans, not a single trace was left for historians. Our only knowledge of Hannibal comes from the works of Livy and Polybius, historians who have a rather severe bias against him.[82] In many ways, Livy understood Hannibal through a Roman lens. To Livy, Hannibal, even though he was from an alien culture, was an ideal Roman commander.[83]

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[82]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic,* 84.

[83]Titus Livy, *The War with Hannibal: The History of Rome From Its Foundations (Books 21–30),* 512.

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How else could he have beaten the Roman legions? The only vice Livy places upon Hannibal is avarice, hardly a glaring fault.[84] Historians know little of where Hannibal was educated or what conditions he grew up in; most historians of antiquity held him in high regards. His actions as a general though are open for examination.

As an operational artist, Hannibal was superb. He planned an extensive campaign to attack the Roman countryside and draw the Romans into battle at a time and place of his choosing. Once the Romans engaged, he was able to execute a series of tactical maneuvers that completely surprised the Romans and caught them off guard. According to O'Connell, the only glaring omission in his operational planning was that he had no end state in mind for his invasion of the Italian peninsula.[85] According to current US Army doctrine, the end state is a set of required conditions that defines achievements of the commander's objectives.[86] Sun Tzu believed that a commander had to know what would constitute victory before he took the battlefield or else victory would elude him. [87] It is this lack of an end state that brings fault to the idea of Hannibal being an Eastern commander; he only knew that he wanted to go to war with Rome. After the Battle of Cannae, Hannibal wandered around the Italian peninsula, trying to raise a rebellion against the Romans. In many ways "Hannibal's success at Cannae resembled the Japanese surprise at Pearl Harbor—a brilliant tactical victory that had no strategic aftermath and tended to galvanize rather than unnerve the manpower of the defeated."[88] Hannibal won a great victory, but

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[84]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 84.

[85]Ibid., 87.

[86]United States Army, *Unified Land Operations* (ADRP 3-0) (Washington DC: Department of the Army, May 2012), 1–06.

[87]Sun Tzu, *The Art of War*, 167–168.

[88]Victor Davis Hanson, *Carnage and Culture: Landmark Battles in the Rise to Western Power* (New York: Anchor, 2002), Kindle Electronic Edition: location 2163.

failed to plan for or capitalize on his catastrophic success. This lack of foresight does not reflect well on Boyd's interpretation of Hannibal as an Eastern commander.

Boyd's classification of Hannibal as an Eastern commander was a key point in his theories. Boyd defined an Eastern commander as one who would attempt to shatter his enemy prior to battle; in contrast, a Western commander was one who was more concerned with winning the battle itself.[89] Interestingly, the general who ultimately defeated Hannibal was Scipio Africanus; Liddell Hart held Scipio in such high regard that he considered him to be greater than Napoleon.[90] Hannibal, genius though he was, lucked out when he opposed Varro. Patton quipped in 1939, "To have Cannae you must have a Varro…in order to win a great victory you must have a dumb enemy commander."[91] This does not diminish the effectiveness of the double envelopment of the Roman legions, but a capable commander would not likely fall for Hannibal's deception.

Much of the blame for the Roman defeat at Cannae is a result of Roman failures. Several underlying factors occurred before the battle tarnish the idea of Hannibal as a military genius, though to his credit he was able to take advantage of them. The Roman Senate had finally grown tired of Fabian's war of strategic retreat. Even though this Fabian retreat was accomplishing Fabian's goal of weakening Hannibal's forces and drawing him into battle, the Roman people grew weary. To placate the population, the Roman Senate replaced Fabian with the dual Consuls, Varro and Paullus.[92] To make matters worse, the four legions they received under their control

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[89]John Boyd,"Patterns of Conflict", 14.

[90]See B. H. Liddell Hart, *Scipio Africanus: Greater Than Napoleon* (New York: Da Capo Press, 2004). The title alone speaks to Liddell Hart's admiration of Scipio.

[91]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 265–6.

[92]Ibid., 135.

were full of raw recruits. Earlier in the campaign, Hannibal had soundly defeated the Romans three other times in a two-year span; though not nearly as individually destructive as Cannae would prove to be, these battles forced the Romans to rebuild their legions. A third of Rome's frontline troops of more than a third of a million men of military age were to be killed, wounded, or captured at Ticinus, Trebia, Trasimene, and Cannae.[93] Additionally, the Roman army that met Hannibal at the Battle of Cannae was comprised of four legions when the normal army was two. This increased size made the normally mobile Roman legions more unwieldy on the battlefield. Finally, the Roman legion was short on cavalry. The Carthaginian cavalry was actually much stronger than the Roman forces. While the Roman infantry outnumbered the Carthaginian infantry, their cavalry was outnumbered two to one. Additionally, the Carthaginian cavalry was comprised of Numidian and steppelike warriors.[94] Their increased speed, maneuverability and experience were able to overwhelm the Roman forces. The mismatch of cavalry, combined with the inexperience of the Roman legions put the Roman forces at a qualitative disadvantage even though they had the greater number of men. The idea that Hannibal was an outmatched commander does not hold up to thorough study. Hannibal was able to recognize that he held a position of advantage that he could exploit against the Romans. In keeping with the principles of Sun Tzu, the Carthaginians defeated the Romans before the battle began, a lesson Boyd did not miss.

Boyd even drew support for the moral style of warfare from the Battle of Cannae. Even though the Roman army that met Hannibal at Cannae was not fighting under what they would consider normal circumstances, Hannibal complicated the situation more. Hannibal used the

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[93]Victor Davis Hanson, *Carnage and Culture: Landmark Battles in the Rise to Western Power*, Kindle Electronic Edition: location 2135.

[94]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 140.

morale of the Romans against themselves. The Roman soldiers were furious over Hannibal's ravaging of the countryside, which made them more aggressive. [95] During the battle itself, Hannibal used the Gauls against the Roman center, a tactic that falls within Boyd's definition of moral warfare. Hannibal understood what the Romans feared and what would cause them to become undisciplined in battle. Because the Romans had previously conquered the Gauls in Spain, Hannibal was able to use the anger of the Gauls to bring them under his banner and then turn it against the Roman fear of them.[96] Knowing that the Gauls would incite the Romans to attack, he planned the Gaulish withdrawal to extend the Romans and expose their flanks. Hannibal hid his cavalry behind an infantry screen. Once the Romans were in place, Hannibal sprung the trap. Unfortunately for the Roman legions, Varro and Paullus were incompetent commanders who did not understand what was happening on the battlefield until it was too late. The incompetence of Varro was a decisive factor in the defeat of the Roman legions that day because Hannibal was able to act faster than Varro could react. Boyd recognized that Hannibal was able to operate inside the Roman OODA loop and thus paralyze the Roman legions. The rout was inevitable.

Boyd was interested in showing an unbroken link back to the ideas of Sun Tzu in order for modern forces to fight effectively on the modern battlefield. Beyond the explicit historical points that Boyd drew from the Battle of Cannae, the battle would also demonstrate the dynamic nature of warfare. Cannae would be Hannibal's swan song. Hannibal would never be able to replicate the astounding victory he had a Cannae, yet the defeated Roman legions would become legendary in later years as the dominant force in the Mediterranean. During his lectures, Boyd argued that victory in battle is truly about being more adaptable than one's opponent — one has

[95]Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic*, 133.

[96]Ibid., 91.

to be willing to adapt his thoughts to the situation at hand.[97] The Romans, having experienced crushing defeat at the hands of the hated Carthaginians, went back to the drawing board. Finding their own adaptable genius in Scipio Africanus, the Romans then proceeded to demolish the Carthaginian forces and dismantle the Carthaginian state.

There is some conjecture as to whether the Carthaginian forces were that different from the Roman forces they faced. Interestingly, scholarship that is more recent shows that the forces of the Carthaginians were not that different from those of the Romans. While Boyd argued that the use of envelopment made Hannibal an Eastern commander, the use of strategic retreat by the Romans is no different. Gaddis made the argument that a historian can use counterfactuals to highlight how things may have turned out differently in order to identify the root cause.[98] One could argue that Fabian was an Eastern commander. Fabian was trying to draw Hannibal into a battle of Fabian's choosing. While the idea of retreating and then attacking once you were in a position of advantage is an old idea, Fabian became known for this tactic in his initial retreat from Hannibal. To the supposed Western mindset, this strategy was anathema. Another Eastern general Boyd examined, Genghis Khan, also made heavy use of the Fabian defense when matched up against a clearly superior force.[99] For the Mongols, the Fabian defense was an acceptable tactic. Had the Roman Senate allowed Fabian to continue his strategy, then Hannibalwould not have defeated the Roman forces at Cannae. Once the change in leadership occurred though, Hannibal, much like Genghis Khan centuries later against Asian and European armies, was able to goad the Roman legions into attacking from a position of disadvantage

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[97]John Boyd, "Revelation" (Defense and the National Interest, 1987), 1. http://pogoarchives.org/m/dni/john_boyd_compendium/revelation.pdf (accessed February 5, 2013).

[98]John Lewis Gaddis, *The Landscape of History*, 100–102.

[99]Timothy May, *The Mongol Art of War* (Westholme Publishing, 2007), Kindle Electronic Edition: location, 1854.

THE GOLDEN HORDE

In the early 13th century, Genghis Khan drove his horde of Mongol and Turkish soldiers across the plains of Asia, eventually threatening Europe. Such a simple sentence cannot illustrate the military successes and the resulting terror born from the style of warfare Genghis' armies conducted against their foes. Born Temuchin[100] in Mongolia in 1162, Genghis Khan had a genius for organization, administration and planning which he developed into an entirely new military system. Leaving his native Mongolia, Genghis conquered numerous tribes as he fought westward conjoining them into his horde of Tatars. By AD 1218, the Khan's empire stretched from the Great Wall of China to modern day Kazakhstan.[101] By 1227, the year of his death, he had added China and Persia to his list of conquests.

Much like other conquerors that forged worldly empires, Genghis died before he realized his vision of conquering Europe. Unlike Alexander the Great, though, his subordinates and heirs were able to continue the success of the Mongol Horde because of the military and governing system Genghis implemented.[102] His son Ogatai and his greatest general, Sabatui, eventually threatened Europe with invasion. How Genghis Khan's armies were able to defeat those in the West, ones that were better armed and equipped, while operating in widely scattered formations is what interested John Boyd.[103]

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[100]There are alternate spellings throughout literature. For the purpose of this paper, Genghis will be used to refer to Temuchin, or Genghis Khan.

[101]Trevor Nevitt Dupuy, *The Military Life of Genghis: Khan of Khans* (New York: Franklin Watts Inc, 1969), xv.

[102]Ibid., 94–98.

[103]John Boyd, "Patterns of Conflict", 27.

<u>Boyd's Analysis</u>

Boyd believed the Mongols relied heavily on the teachings of Sun Tzu. As such, Genghis Khan and his descendants were the epitome of Eastern commanders.[104] While they were not the first army to practice maneuver warfare in Boyd's estimation, they were the first to perfect it while seamlessly blending in elements of moral warfare. They were able to use this combination of maneuver warfare with an effective propaganda campaign to demoralize and defeat armies that were much stronger.[105] Boyd viewed the Mongols as relying on superior mobility, communications, intelligence and leadership in their battles to expand the Mongol empire. All of these items in concert worked to exploit and enemies' vulnerabilities and weaknesses. The speed at which the Mongols executed these maneuvers undermined the will of the opponent, which exposed further vulnerabilities and weakness.[106] The combination of mobility, communications, intelligence and leadership with propaganda and terror allowed the Mongols to operate inside their opponent's OODA loop.[107] The maneuver element that made the Mongols highly effective was their cavalry.

Every Mongol soldier was an equestrian; a concept not lost on Boyd. The Mongols organized their army around the cavalry. Light, highly mobile warriors had an easier time moving across the battlefield than the heavily armored destriers favored by the knights of Europe. A typical Mongol horde, or army, had 20-30,000 cavalry soldiers, one-third of which were heavy cavalry. Each soldier had two to three horses available for battle. Because of this organization, the Mongols were able to move rapidly across the battlefield adding to the moral impact on their

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[104]Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War*, 331.

[105]John Boyd, "Patterns of Conflict", 25.

[106]Frans P.B. Osinga, *Science, Strategy and War: The Strategic Theory of John Boyd*, 144.

[107]Grant T. Hammond, *The Mind of War: John Boyd and American Security*, 126

enemies.[108] Besides the Mongol organizational structure, Boyd drew from his readings the lesson that Mongolian battlefield precision was a result of intensive training. This training allowed Genghis Khan to seize and maintain the initiative, always attacking.[109]

In keeping with Sun Tzu's principles, the Mongols also practiced the art of misdirection and deception. They avoided using the same patterns prior to combat so their enemies were unaware from what direction the Mongols would attack. This misdirection led Boyd to the conclusion that the outnumbered Mongols created impressions of terrifying strength.[110] They would then simultaneously attack the enemy forces from multiple directions before they had the opportunity to concentrate their forces. These separate avenues of advance would intimidate and confuse the Mongol's enemies.[111] Additionally, the Mongols would advance a light force to fix the enemy center while their heavy cavalry would maneuver to attack the flanks and lines of communication. Finally, the Mongols were all trained archers and supported their maneuver through extensive use of fire.[112] This falls in line with Boyd's' concept that light, fast forces were the maneuver element. By harassing the enemy in this way, the Mongols were practicing maneuver warfare and creating confusion. Boyd, saw this strategy as the true beginning of maneuver warfare.

Boyd observed that the Mongol operational plan followed a fixed method.[113] This method, though fixed, contained a high degree of unpredictability. Boyd clearly saw the

[108]Trevor Nevitt Dupuy, *The Military Life of Genghis: Khan of Khans*, 20.

[109]Ibid., 23.

[110]John Boyd, "Patterns of Conflict", 28.

[111]Grant T. Hammond, *The Mind of War: John Boyd and American Security*, 126.

[112]Trevor Nevitt Dupuy, *The Military Life of Genghis: Khan of Khans*, 25–27.

[113]Harold Lamb, *Genghis Khan: Emperor of All Men* (New York: Penguin, 1963), 195–6.

similarities between the Mongol use of maneuver and his own experience flying fighter jets.

Another example of Genghis' use of misdirection came while he helped support a Khitan

rebellion against the Chin state. During the siege, at one point Genghis withdrew his army as if in

retreat only to return the following day. He was able to rout the Chin army that was looting the

abandoned Mongol camp.[114] Misdirection played a key factor in their success.

From the Golden Horde, Boyd also drew many of his observations concerning moral

conflict. According to Boyd, in moral conflict there were no fixed organizations,

communications, tactics or leadership. Everything was fluid. Subordinates had wide freedom to

exercise initiative as long as it fell in line with their superior commanders intentions. Similar to

the U.S. Army concept of Mission Command,[115] subordinate commanders only had to follow the

general intentions of their commanders.[116] Morals, or human values, were the basis for unit

cohesion instead of material superiority. Finally, commanders created bonds based on trust.[117] To

Boyd, Genghis Khan, and later Kublai, exemplified all of these traits in the management of the

horde.

<u>The Mongols — Synthesis</u>

Research into Genghis Khan has progressed rapidly over the past twenty years. Scholars

first translated *The Secret Life of Genghis Khan* from the original Mongolian in 1972. It was not

until the past few years that historians completed coherent version of the work.[118] In keeping with

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[114]Trevor Nevitt Dupuy, *The Military Life of Genghis: Khan of Khans*, 39.

[115]United States Army, *Mission Command* (ADP 6-0).

[116]Trevor Nevitt Dupuy, *The Military Life of Genghis: Khan of Khans*, 43.

[117]John Boyd, "Patterns of Conflict", 118.

[118] Jack Weatherford, *Genghis Khan and the Making of the Modern World* (New York: Broadway, 2005), Kindle Electronic Edition: location 288. *The Secret Life of Genghis Khan* had many elements of Mongolian culture and history that were indecipherable until the fall of the

Boyd's own principle that learning was never complete, Boyd would have appreciated the new ideas that historians have uncovered in their scholarship. For the studies that Boyd completed, the work of Harold Lamb is still highly regarded to this day, even though Lamb wrote it in the 1920s.[119] Boyd's sources clearly show the data points Boyd used in his theory construction. When combined with additional scholarship a clear picture of the Mongol style of warfare emerges.

While the Mongols were capable warriors in the realm of maneuver and moral warfare, several other factors allowed them to win battles on the steppes of Asia and in the countries of Europe. Boyd highlighted logistics as a key component allowing Mongol success. The Mongols created simple methods to efficiently maintain camp and to feed their massive armies. First, the Mongols laid out every base camp following an identical blueprint—soldiers knew what to expect, even if transferring from one army to another.[120] Second, the Mongols were masters of foraging from the land. As nomads, they had lived their entire lives on the move.[121] These two elements were critical in allowing the Mongols to transverse large swaths of terrain seemingly overnight.

Command and control was another area where Boyd highlighted Mongol achievements. Effective command and control was necessary for the highly mobile nature of Mongol warfare. Having no written communications, the Mongols transmitted all orders orally. Dupuy, writing before *The Secret Life of Genghis Khan* was available, noted only that Mongol command and control was highly effective.[122] Recent scholarship highlights the innovative method Genghis

Soviet Union. Once historians had access to Mongolia, research progressed quickly.

[119]Jack Weatherford, *Genghis Khan and the Making of the Modern World*, Kindle Electronic Edition: location 238.

[120]Ibid., Kindle Electronic Edition: location 1927.

[121]Ibid., Kindle Electronic Edition: location 1940.

[122]Trevor Nevitt Dupuy, *The Military Life of Genghis: Khan of Khans*, 68.

Khan used to prevent mistakes from creeping into orders over repeated retellings. He instituted a system where commanders gave all orders in a highly codified rhyming system. This allowed soldiers to easily remember orders and transmit them if necessary.[123] This easy transmission of orders, along with the wide latitude Genghis gave to his commanders, allowed the Mongol Horde to adapt quickly to changing conditions in battle. Genghis Khan also had the advantage of lessons learned from a lifetime of warfare; he had known some of his troops and officers for more than a quarter century.[124] These elements contribute to the effectiveness of the Mongols style of maneuver warfare; they show that leadership, logistics, and command and control are as important as tactics.

Propaganda and terror were two other factors the Mongols used to great effect. Genghis Khan sought to undermine his enemies through any method, whether social turmoil or battlefield terror.[125] Genghis made this warfare possible because he had a single purpose in mind—there was only honor in winning. The Mongols realized it was better to convince a city or fortress to surrender without resistance rather than become engaged in a lengthy and wasteful siege. Therefore, the Mongols gained a notorious reputation for massacres.[126] This practice was in keeping with the precepts of Sun Tzu that a battle avoided or won before the armies met was the highest form of warfare. Spreading stories about the horrors the Mongols would inflict or using trickery was acceptable because it set conditions to allow victory and therefore honorable in battle.[127]

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[123]Jack Weatherford, *Genghis Khan and the Making of the Modern World*, Kindle Electronic Edition: location 1944.

[124]Ibid., Kindle Electronic Edition: location 1952.

[125]Ibid., Kindle Electronic Edition: location 1962.

[126]Timothy May, *The Mongol Art of War*, Kindle Electronic Edition: location 1950.

[127]Jack Weatherford, *Genghis Khan and the Making of the Modern World*, Kindle

Adaptability was another area where the Mongol armies excelled. As Timothy May points out, "The key to Mongol success in war was their pragmatic melding of traditional and still effective steppe tactics with the new tactics, weapons, and forms of warfare that they encountered during their conquests."[128] Thousands of years of practice on the plains of Asia melded the Mongols into a fierce fighting force. Their willingness to innovate, though, allowed them to remain effective as they marched towards Europe. Their flexible leadership and command structures allowed them to quickly disseminate these new tactics throughout their armies. Boyd recognized the contributing factors that made the Mongol horde successful. He learned from the Mongols that in order for new tactics to be successful, a change had to occur in the underlying structure of the military forces.

There is little doubt the Mongols influenced modern theories on maneuver warfare. Liddell Hart likened the Mongol warriors, with their superior firepower and mobility, to modern fighter aircraft.[129] The history available readily supports the path from the Mongols to Boyd's theories. The Mongol style of warfare heavily influenced modern theories aside from Liddell-Hart. Guderian, Tukhachevsky, Fuller and later Boyd are all adherents of the maneuver warfare as practiced by the Mongols. Boyd went beyond his predecessors though in adding a moral element to equation. History supports this as well. What Boyd missed though is a key element of the Mongol style of warfare; Mongol forces had the objective of annihilating the opposing force.[130] The Mongols had more in common with Boyd's view of Clausewitz than Boyd would

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Electronic Edition: location 2035.

[128]Timothy May, *The Mongol Art of War*, Kindle Electronic Edition: location 2074.

[129]Thomas J. Craughwell, *The Rise and Fall of the Second Largest Empire in History: How Genghis Khan's Mongols Almost Conquered the World* (Beverly, MA: Fair Winds Press, 2010), Kindle Electronic Edition: location 1941.

[130]Timothy May, *The Mongol Art of War*, Kindle Electronic Edition: location 3339.

possibly have admitted. This element is lacking from modern theories on maneuver warfare. Maneuver warfare becomes solely a means of bypassing and defeating, if necessary, the fielded forces and instead attacking directly at the heart of the enemy.

CONCLUSION

From these ancient military episodes, of which the Battle of Cannae and the Mongol Invasion are two examples, Boyd derived the key concepts of his theories—maneuvering against an opponent rapidly and unpredictably against their vulnerabilities would cause them to become disheartened and reduce them to a state of paralysis. This study of history, along with the theories he developed in his essay "Destruction and Creation" and his own experience as a fighter pilot, informed the creation of the OODA loop. In turn, this became the central concept in Boyd's understanding of maneuver warfare. In order to defeat an enemy, you had to attack him in such a way that made them unable to react. Once in this state, the aggressor had complete control over the battle. This, to Boyd, was how smaller forces were able to defeat superior forces.

Boyd started looking at history to understand how armies maneuvered on the battlefield. During his study, he wanted to know how smaller forces had been able to defeat larger forces. Boyd ultimately discovered a kindred spirit in Sun Tzu who looked at war in the same way as Boyd. From Sun Tzu, Boyd took several key requirements for victory in battle: foreknowledge, cohesion, surprise, deception and deceit, being unfathomable and speed. Boyd then proceeded to reconstruct history in light of Sun Tzu's teachings. For Boyd, the Battle of Cannae showed the superiority of maneuver on the battlefield. The Carthaginians were able to defeat a superior Roman army through a perfectly executed double envelopment. The Mongol Horde demonstrated the evolution of maneuver warfare. The use of highly mobile, light cavalry combined with the use of moral warfare allowed Genghis Khan to defeat opponents from Asia to Europe.

Boyd effectively used ancient history to develop and support his theories on maneuver warfare. First, he used ancient history as a starting point for his theories. He did not solely rely on

ancient battles to develop his theories, but to show the application of his maneuver warfare theories from Sun Tzu to the modern era. Second, history provided examples of his theories in action. While Boyd may not have gotten all the details correct, he was not trying to develop precise doctrine from the ancient battles. Boyd used the battles to demonstrate the continuous and enduring nature of the principles of maneuver and moral warfare. Ultimately, Boyd hoped to reform the military; a look through current Army doctrine shows the impact Boyd's theories have had on the conduct of military operations.

In the final slide of his presentations, Boyd summed up his theories with a metaphysical riddle. During his lectures, Boyd would start with a series of pictures involving disparate objects. Boyd then proceeded to derive the concept of a snowmobile from a bicycle, a skier and a motorboat—each individual part contributed something to create a whole greater than the sum of the parts. At the end of his briefing, Boyd would then posit that a loser was someone who could not build snowmobiles from disparate concepts when facing uncertainty and unpredictable change. A winner, on the other hand, was someone who could. In today's operational environment, the operational artist must be able to build a snowmobile. Ancient history, as shown by Boyd's development of his theories on maneuver warfare, is another tool available to aid in planning in the face of uncertainty. History, both ancient and modern, serves as an example of how others have tackled the problems we face in today's often uncertain operating environment. From these objects, one could postulate the existence of a snowmobile, an object that is more than the sum of its parts. In order to create the snowmobile, one has to be willing to adapt his thoughts to the situation at hand.[131]

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[131]John Boyd, "Revelation" (Defense and the National Interest, 1987), 1. http://pogoarchives.org/m/dni/john_boyd_compendium/revelation.pdf (accessed February 5, 2013).

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